UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII, MONTANA OFFICE
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ROD BRIEFING

PROCESS PONDS OPERABLE UNIT
EAST HELENA SMELTER SITE
EAST HELENA, MONTANA

September 1, 1989

Site Background

* The East Helena Smelter Site is an operating primary lead smelter owned by Asarco Incorporated and located three miles east of Helena. It has operated continuously since 1888 and emissions have affected most of the Helena Valley (approx. 100 sq. mi.). Some 20 elements, including arsenic, cadmium, copper, lead and zinc, are enriched in the valley's soils, water and vegetation.

* Other responsible parties include the American Chemet Corporation (still operating) and ARCO Coal Company (zinc recovery operation sold to Asarco in 1972). Their contribution to deposition of contaminants amounts to less than 10 percent.

* Asarco has conducted the major share of the RI/FS under two consent orders with EPA (1984 and 1988). Phase II RI/FS activities focused on soils, water and vegetation within two and one half miles of the smelter.

* Five operable units have been established:

    1. Process ponds and process fluids;
    2. Surface water, soils, vegetation, livestock, fish and wildlife;
    3. Ground water;
    4. Slag pile; and
    5. Ore storage areas.

* Elevated arsenic and heavy metals in ground water, both on and off the plant site, prompted EPA to recommend a separate and expedited RI/FS for the sources of

contamination--the process ponds. They include:

Lower Lake
Former Thornock Lake
Speiss granulating pit and pond
Acid plant water treatment facility

* Process Ponds RI/FS Report and Proposed Plan are in public review until September 20.

Contaminants in Process Ponds Water and Sediments

* Lower Lake water contains up to 25 mg/l total arsenic and 48 mg/l total lead. Other metals are similarly elevated.

* Bottom sediments of Lower Lake contain up to 2,800 mg/kg arsenic and 15,000 mg/kg lead. Thornock Lake (now dry) contains up to 120,000 mg/kg arsenic and 38,000 mg/kg lead. Other elements are similarly elevated. The bottom sediments of Lower Lake and Thornock Lake are KO-65 hazardous wastes.

* Soils under the speiss area contain up to 1,750 mg/kg arsenic and 5,500 mg/kg lead. Soils under the acid plant contain up to 12,000 mg/kg arsenic and 14,000 mg/kg lead.

* Dissolved arsenic in the saturated soils under the speiss area is as high as 700 mg/l. (MCL is 0.05 mg/l.)

* Dissolved arsenic in the shallow ground water under portions of East Helena is about 20 times the MCL (up to 1.2 mg/l).

Risk Associated with Process Ponds

* The affected shallow aquifers are not a source of drinking water. Therefore, there is currently no direct human exposure to arsenic through ground water.

* Lead and other heavy metals are less mobile than arsenic. They are below MCLs in ground water under East Helena.

* The potential exists for human health risk if the arsenic migrates into deeper aquifers.

* Environmental risks are a problem. Lower Lake seeps into Prickly Pear Creek at about 15 gpm. Although

primary MCLs are not exceeded, aquatic organisms in Prickly Pear Creek are already stressed by mine leachate from headwaters.

Preferred Remedies

* Remedial actions preferred by the EPA will eliminate future contact between process waters and the underlying soils and ground water. This will be accomplished by constructing tanks to replace the ponds and upgrading or lining facilities that hold or convey process fluids.

* Treatment of water contained in Lower Lake and discharge to the East Helena Public Water Treatment Facility. In-place treatment of the water by coprecipitation may be a promising contingency remedy.

* Excavation of contaminated soils and sediments under the existing ponds, followed by drying and smelting.

Issues

* Depth of excavation. Bottom sediments of Lower Lake and Thornock Lake are a RCRA listed waste (KO-65). This artificially deposited layer of sludge and sediment is about 12-36 inches deep. But, about 15 feet of naturally deposited sediments lie below. Arsenic and metals are elevated throughout these lower sediments; however, concentrations decrease as depth increases. Soil leach test results (for naturally deposited sediments) indicate that the leachate produced meets primary MCLs. Based on those test results, Asarco sees no need to excavate below the artificially deposited layer. EPA favors excavation of the artificially deposited layer plus 24 inches as a safety margin. The State, fearing that the leachate from the soil leach tests will not meet its more stringent water quality standards, favors deeper excavation to bring arsenic and metals in the sediments closer to background levels, thus reducing the chance of continued ground water contamination. The State's attorney has argued that all sediments with arsenic levels above background should be excavated.

* Water treatment standards. Whether Lower Lake water is treated in-place or treated for discharge into the POTW, the standards for acceptable treatment remain undecided. If treated in-place, the State contends that water quality standards for surface water must be met, including secondary MCLs and aquatic standards. That level of treatment is probably not possible,

particularly for arsenic.

* Handling of hazardous wastes (drying, stockpiling and smelting). This issue presents separate problems for each of the process ponds. It is best summed up by the following question: Will slag produced by smelting of hazardous wastes (KO-65 sediments, for example) require special handling or treatment as a hazardous waste itself?

* Source elimination, as proposed for the process ponds, is only the first step. The Comprehensive Site-wide RI/FS will address problems associated with contaminated soils, ground water and surface water. Drawing the operable unit boundaries for the process ponds and deferring problems to the next phase of the RI/FS process have been very controversial in the development of this feasibility study and the Proposed Plan.

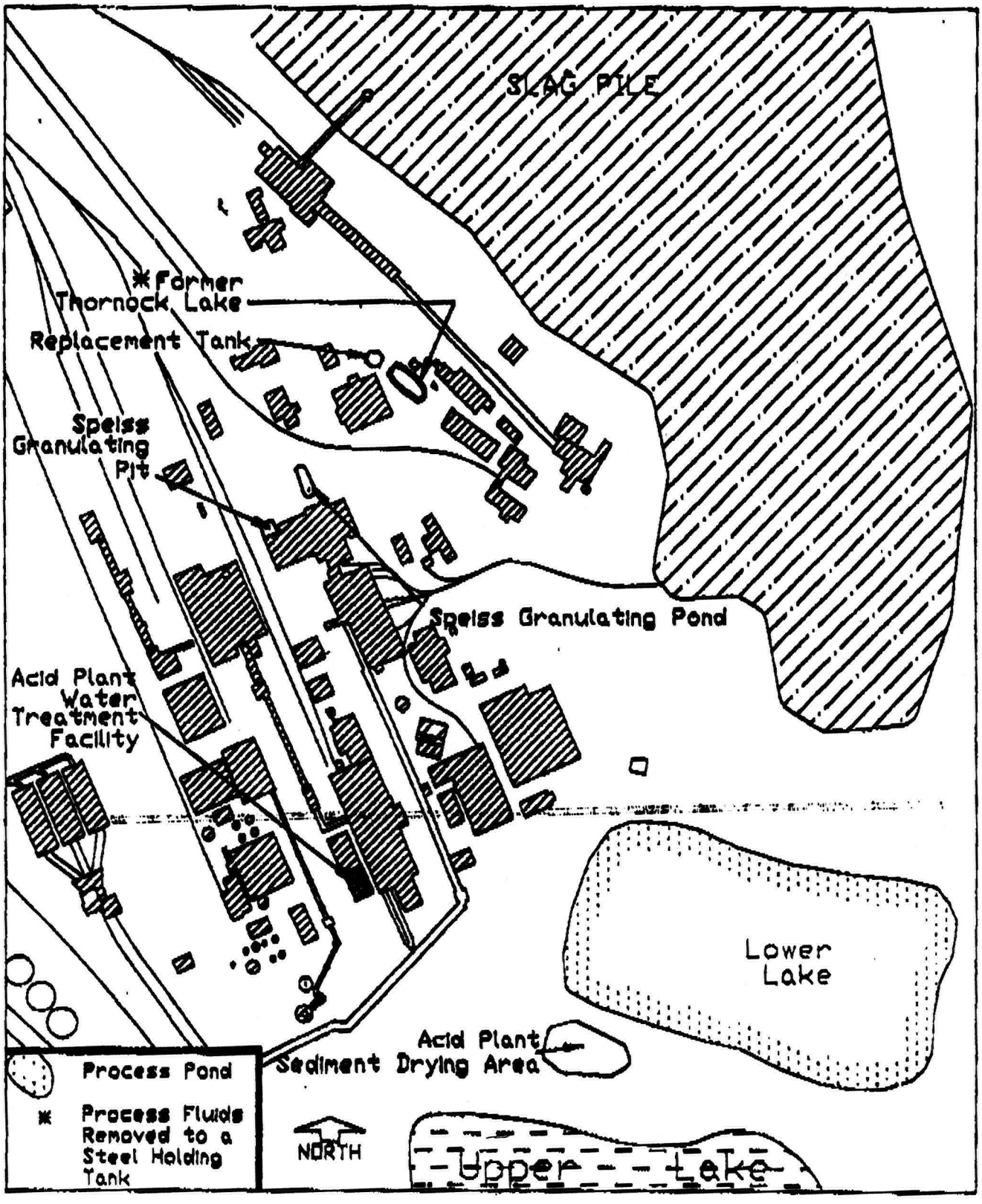

Figure 1. Process Pond Location Map